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Serial No. 10/815,004

Claim Listing

1. (previously amended) A method of deployment of a biopsy marker at a biopsy surgical site within a body by use of a biopsy device, the method comprising:
providing a biopsy device including
a probe defining a cutter lumen having proximal and distal openings, and
a cutter configured to be distally advanceable and proximally retractable through the cutter lumen;
retracting the cutter to expose the proximal opening of the cutter lumen;
providing a biopsy marker introduction assembly comprising an introducer tube, a marker disposed in the introducer tube, and a marker deployment rod disposed for translation within the introducer tube, the marker deployment rod having trailing and leading ends and a cutter seat portion proximate to the trailing end, configured to abut with the cutter, the cutter seat having a diameter greater than that of the cutter;
inserting the biopsy marker introduction assembly into the proximal opening of the cutter lumen;
bringing the cutter and the cutter seat portion of the marker deployment rod into abutment;
and
distally advancing the cutter to drive the marker deployment rod and thus the marker to cause deployment of the marker through the distal opening of the cutter lumen at the biopsy surgical site.
2. (original) The method of claim 1, wherein a distal portion of the cutter lumen communicates with a pneumatic source, the method further comprising:
insufflating the biopsy surgical site with the pneumatic source.
3. (cancelled)
4. (Previously amended) The method of claim 1, further comprising:

Serial No. 10/815,004

forming a pneumatic seal between the marker deployment rod and the introducer tube, wherein distally advancing the cutter forms a syringe pressure proximally to the pneumatic seal.

5. (Previously amended) The method of claim 1 further comprising:
forming a pneumatic seal between the marker deployment rod and the introducer tube; and
forming a vacuum assist pressure in a distal portion of the cutter lumen, thereby distally drawing the marker deployment rod to deploy the marker.
6. (canceled)
7. (cancelled)
8. (previously amended) The method of claim 1, further comprising proximally extending the marker deployment rod from the cutter lumen wherein distally advancing the cutter deploys the marker as the cutter approaches the cutter lumen.
9. (previously amended) The method of claim 1, further comprising distally advancing the cutter to position the marker deployment rod across a distal lateral opening in the biopsy probe enabling retraction of the biopsy probe without disturbing the deployed marker.
10. (cancelled)
11. (original) The method of claim 1, further comprising percutaneously deploying the marker during a core needle biopsy procedure.
12. (previously amended) A biopsy marker introduction device for deploying a biopsy marker through a biopsy instrument having a probe defining a cutter lumen including a probe lateral distal opening and a probe proximal opening, and a cutter distally advanceable and

Serial No. 10/815,004

proximally retractable through the cutter lumen, the biopsy marker introduction device comprising:

an introducer tube configured to be received in the cutter lumen and having a tube lateral distal opening;

a marker slidably received in the introducer tube; and

a marker deployment rod at least partially disposed in the introducer tube proximal to the marker and slidably received in the introducer tube, the marker deployment rod having a cutter seat configured for abutment with the cutter to deploy the marker through the tube lateral distal opening,

wherein the introducer tube and the tube lateral distal opening are configured such that when the introducer tube is inserted into the cutter lumen, the tube lateral distal opening and the probe lateral distal opening can be aligned at least in part, and wherein the marker deployment rod has a length adapted for cooperation with the cutter such that when the tube, marker and marker deployment rod are inserted into the cutter lumen, distally advancing the cutter will drive the marker deployment rod and cause the marker to be urged through the tube lateral distal opening and the probe lateral distal opening.

13. (previously amended) The device of claim 12, further comprising a proximal collar attached proximally to the introducer tube and configured for manipulating the device into the cutter lumen.
14. (original) The device of claim 12, further comprising an alignment feature configured to rotationally orient the tube in the cutter lumen.
15. (previously amended) The device of claim 12, further comprising a pneumatic sealing feature dynamically sealing the marker deployment rod to the tube.

Serial No. 10/815,004

16. (original) The device of claim 13, wherein the tube distally includes a deployment opening, the device further comprising a removable sealing tip engageable over the deployment opening.
17. (original) The device of claim 12, wherein the distal opening includes a ramped surface to rampingly eject a distal end of the marker.
18. (previously amended) The device of claim 17, wherein the marker deployment rod distally terminates in a driving surface for rampingly ejecting a proximal end of the marker.
19. (previously amended) The device of claim 12, wherein at least a portion of the tube and marker deployment rod comprise a resilient material for flexibly inserting the device into the biopsy instrument.

Serial No. 10/815,004

20. (previously amended) A biopsy system for obtaining a biopsy sample, the biopsy system comprising:

a biopsy probe including a cutter lumen that communicates between a probe lateral distal opening and a probe proximal opening;

a biopsy handle holding the biopsy probe, having an actuator for cutting the biopsy sample through the biopsy probe;

a cutter operably connected to the actuator, and distally advanceable and proximally retractable through the cutter lumen; and

a marker introduction device comprising:

an introducer tube configured to be received in the cutter lumen and having a tube lateral distal opening,

a marker slidably received in the tube, and

a pusher proximal to the marker and slidably received in the tube, and having a proximal cutter seat having a diameter greater than that of the cutter, the cutter seat configured for abutment with the cutter;

wherein the introducer tube and the tube lateral distal opening are configured such that when the tube is inserted into the cutter lumen, the tube lateral distal opening and the probe lateral distal opening can be aligned at least in part, and wherein the pusher has a length adapted for cooperation with the cutter such that when the tube, marker and pusher are inserted into the cutter lumen, distally advancing the cutter will drive the pusher and cause the marker to be urged through the tube lateral distal opening and the probe lateral distal opening.

21. (original) The biopsy system of claim 20, wherein the pusher is operably configured to dynamically seal to the tube, the biopsy system further comprising a vacuum assist system communicating pneumatically with a distal portion of the probe to assist in marker deployment.

Serial No. 10/815,004

22. (original) The biopsy system of claim 21, wherein the vacuum assist system is operably configured to insufflate a surgical site.
23. (original) The biopsy system of claim 21, wherein the vacuum assist system is operably configured to distally draw the pusher to deploy the marker.
24. (original) The biopsy system of claim 20, wherein the pusher is operably configured to close the distal opening in the biopsy probe subsequent to marker deployment.